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Spies in sky keep two big powers in balance

By DONALD R. MORRIS
Post News Analyst

All that has kept the world from self-destructing this last quarter of a century has been the precarious nuclear balance between the United States and the Soviet Union.

For a few short years America had an overwhelming preponderance of power. We were certain we would never resort to it, but our mere possession of such nightmarish power drove the Russians to distraction. Then they in their turn achieved an edge—and regained a measure of stability—and it was our turn to taste the fear in the phrase "missile gap."

A decade ago the balance was regained and has since been maintained. The number of missiles, their megatonnage and their guidance systems are largely irrelevant; what counts is that neither power can launch a preemptive strike with any hope of survival, and on this balance hangs the peace of the world.

Tiger by the tail

The balance, however, is far from static. Both powers hold a fearsome tiger by the tail. Research and development must continue lest one side or the other achieve a breakthrough in delivery or defense, which might destroy the balance. The expense of such a breakthrough—indeed the expense of maintaining the current balance—is so hideous that both powers would like to avoid it. They are committed to a continuing arms race not by the need to achieve a breakthrough but only by the imperative of not permitting the other to do so.

Both sides recognize the need for a mutual effort to scale down their arsenals. In the past, negotiations over disarmament foundered on a single element—trust. The issues at stake were so overriding that neither the U.S. nor the Soviet Union could afford to accept the other's word that an agreement would be adhered to.

The recent SALT talks, however, have achieved initial and encouraging successes, and the key to the progress can be found in an innocuous euphemism the treaties employ: "National technical means of verification". The phrase refers to a program which supplies an acceptable substitute for the missing ingredient of trust, and on that program rests all hope of reversing the arms race.

The "national technical means of verification" are the photo reconnaissance satellites employed by both America and the Soviet Union. The U.S. satellites are referred to as SAMOS (for "satellite and missile-observation system"); the Soviet satellites are referred to as COSMOS, and while neither country will discuss their details, they do, as the result of a 1962 agreement, report each launch and its orbital characteristic to the UN.

The programs give both countries a positive check on the nuclear activities of the other. Neither nation can test or deploy a major new weapons system without timely—and highly detailed—warning accruing to the other.

The United States launches four or five "search-and-find" SAMOS missiles annually from Vandenburg Air Force Base in California. They remain in orbit about a month, covering the entire surface of the globe twice a day, once at night (when infra-red photography, sensitive to heat emissions, gives almost as much information as daytime passes) and once during the day.

The photographic results are radioed back, and despite the loss in resolution, construction work of any description is at once apparent when photos taken a few days apart are superimposed.

Each search-and-find satellite is followed a month or two later by a "close-look" satellite, which photographs the specific areas of interest its predecessor has spotted. These photographs are not transmitted electronically. Instead the satellite ejects the film capsule itself, which is recovered in mid-air by specially equipped planes based in Hawaii.

What photos show

The pictures are analyzed at the National Photographic Interpretation Center (known as "En-pick" to the intelligence community), a little-known joint project located in Washington under the aegis of the Central Intelligence Agency.

The sophisticated interpretation of these photographs provides the vast bulk of what America knows about the Soviet Union, the Eastern bloc countries and the People's Republic of China.

The photos reveal not only major construction — from transportation nets through shipyard activity to all manner of missile facilities — but an astonishing wealth of technical detail as well.

While the U.S. will not talk about the SAMOS program any more than the Soviet Union will discuss the details of COSMOS, the general details of both programs are more or less open secrets.

America's most closely guarded secret, however, is the [illegible] photographic systems employed by SAMOS. (N.P.I.C., in fact, maintains its own security classification system, and a [illegible] organization won't get you past the front door.)

The first generation of satellite cameras a decade ago were lucky to pick up objects six feet across. The third generation in current use will pick up objects less than two feet across, and the resolution may some day be measured in inches. In terms of analysis, this means that not only can new missile sites, or changes in old ones, be recorded, but the precise technical construction of the missile can be reconstructed in fair detail as well.

The Soviets launch perhaps four times as many satellites as America does, partially because theirs do not last as long, and also because the Soviets are given to "tactical" missions — sending a satellite for a special "look-see" when something of interest is going on.

The U.S. prefers to wait for its regularly scheduled shots, and has sent only one tactical satellite aloft — to check Israeli claims that the Soviets were violating the truce by installing missile sites on the banks of the Suez Canal. Soviet photography is good enough to allay their fears that the U.S. is installing new weapons systems, although the resolution of their cameras is not nearly as good as ours.

High-altitude coverage of the Soviet Union started in the early 1950s when balloon-mounted cameras were launched in Europe to drift across Eurasia before being recovered in the Pacific.

From such crude beginnings we advanced to the U-2 aircraft, which worked like a charm until the Soviets finally developed a missile that could bring it down — with disastrous results for American diplomacy. President Eisenhower had approved the U-2 program only after Premier Nikita Khrushchev had rejected his suggestion of "open skies" inspections. The gap between the U-2 flights and the inception of the SAMOS program was fortunately a short one.

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